Table S1: Baseline characteristics of patients.

Characteristics	Experimental (n =48)	Control (n = 45)	*p*-value
Sex, n (%)			0.192
Female	4(8.33)	1(2.22)	
Male	44(91.67)	44(97.78)	
Age, mean (SD)(years)	68.13±8.12	65.18±8.28	0.087
Body Mass Index, mean (SD)(kg/m²)	20.43±2.90	20.61±3.34	0.775
Education, n (%)			0.744
Primary school	34(70.83)	34(76.56)	
Middle school	10(20.83)	9(20.00)	
High school	2(4.17)	2(4.44)	
University	1(2.08)	0(0)	
College Diploma	1(2.08)	0(0)	
Smoking history, n (%)			0.773
Never	5(10.42)	3(6.67)	
Past	18(37.50)	19(42.22)	
Present	25(52.08)	23(51.11)	
Exacerbations Within 1 Year			0.874
0	2(4.17)	1(2.22)	
1	15(31.25)	14(31.11)	
2	14(29.17)	16(35.56)	
≥3	17(35.42)	14(31.11)	
CAT scores, mean (SD)(points)	30.02±4.17	30.33±3.75	0.706
Expense category, n (%)			0.933
Employee medical insurance	5(10.42)	4(8.89)	
Resident medical insurance	17(35.42)	15(33.33)	
Rural medical insurance	26(54.17)	26(57.78)	

Note: SD: Standard deviation; CAT: COPD assessment test.

Table S2: SAS score levels between the control and observation groups at different time points.

Group	n	Baseline (n)		1-Month follow-up (n)		3-Month follow-up (n)		6-Month follow-up (n)	
		No/Mild/ Moderate/ Severe	MTSR (%)	No/Mild/ Moderate /Severe	MTSR (%)	No/Mild/ Moderate/ Severe	MTSR (%)	No/Mild/ Moderate/ Severe	MTSR (%)
Control	45	1/5/12/27	86.67	1/5/12/27	86.67	1/4/11/29	88.89	0/3/11/31	93.33
Experimental	48	2/1/17/28	94.75	2/7/15/24	81.25	2/10/17/19	75.00	3/12/23/10	68.75
χ^2		3.787	1.333	1.081	0.504	6.183	2.999	23.319	8.993
P-value		0.285	0.248	0.782	0.478	0.103	0.083	<0.001	0.003

Note: MTSR: Moderate-to-severe rate= (Moderate + Severe) / Total cases * 100%.SAS score <50 (points) = no anxiety, 50-59 (points) = mild anxiety, 60-69 (points) = moderate anxiety, ≥70 (points) = severe anxiety.

Table S3: SDS score levels between the control and observation groups at different time points.

Group	n	Baseline (n)		1-Month follow-up (n)		3-Month follow-up (n)		6-Month follow-up (n)	
		No/Mild/ Moderate/ Severe	MTSR (%)	No/Mild/ Moderate /Severe	MTSR (%)	No/Mild/ Moderate/ Severe	MTSR (%)	No/Mild/ Moderate/ Severe	MTSR (%)
Control	45	0/3/19/23	93.33	1/2/19/23	93.33	0/3/16/26	93.33	0/3/15/27	93.33
Experimental	48	2/1/15/30	93.75	2/2/23/21	91.67	2/4/25/17	87.50	2/6/27/13	83.33
χ^2		4.303	0.007	0.709	0.093	5.912	0.904	11.243	2.227
P-value		0.231	0.935	0.871	0.761	0.116	0.342	0.050	0.136

Note: MTSR: Moderate-to-severe rate= (Moderate + Severe) / Total cases * 100%.SDS score < 53 (points) = no depression; 53–62 (points) = mild depression; 63–72 (points) = moderate depression; > 72 (points) = severe depression.

CONSORT 2025 checklist of information to include when reporting a randomised trial*

Section / Topic	No	CONSORT 2025 checklist item description	Reported on page no.
Title and abstract			
Title and structured abstract	1a	Identification as a randomised trial	Page 1 (Title)
	1b	Structured summary of the trial design, methods, results, and conclusions	Page 1 (Abstract)
Open science			
Trial registration	2	Name of trial registry, identifying number (with URL) and date of registration	Page 2 (Methods: ChiCTR2400090585)
Protocol and statistical analysis plan	3	Where the trial protocol and statistical analysis plan can be accessed	NA (available from corresponding author upon request)
Data sharing	4	Where and how the individual de-identified participant data (including data dictionary), statistical code and any other materials can be accessed	Page 8 (Data availability statement)
Funding and conflicts of interest	5a	Sources of funding and other support (e.g., supply of drugs), and role of funders in the design, conduct, analysis and reporting of the trial	Page 8 (No funding)
	5b	Financial and other conflicts of interest of the manuscript authors	Page 8 (No conflicts)
Introduction			
Background and rationale	6	Scientific background and rationale	Page 1-2 (Introduction)
Objectives	7	Specific objectives related to benefits and harms	Page 2 (last paragraph of Introduction)
Methods			
Patient and public involvement	8	Details of patient or public involvement in the design, conduct and reporting of the trial	No patient or public involvement in the design, conduct and reporting of the trial.
Trial design	9	Description of trial design including type of trial (e.g., parallel group, crossover), allocation ratio, and framework (e.g., superiority, equivalence, non-inferiority, exploratory)	Page 2(Study design: parallel group, 1:1, superiority)
Changes to trial protocol	10	Important changes to the trial after it commenced including any outcomes or analyses that were not prespecified, with reason	No important changes to the trial after it commenced

Trial setting	11	Settings (e.g., community, hospital) and locations (e.g., countries, sites) where the trial was conducted	Page 2 (single-center public tertiary hospital)
Eligibility criteria	12a	Eligibility criteria for participants	Page 2 (Inclusion/exclusion criteria)
	12b	If applicable, eligibility criteria for sites and for individuals delivering the interventions (e.g., surgeons, physiotherapists)	Clinical pharmacists delivering the intervention had at least 3 years of experience and received standardized training.
Intervention and comparator	13	Intervention and comparator with sufficient details to allow replication. If relevant, where additional materials describing the intervention and comparator (e.g., intervention manual) can be accessed	Page 3 (Clinical pharmacist-led intervention section)
Outcomes	14	Pre-specified primary and secondary outcomes, including the specific measurement variable (e.g., systolic blood pressure), analysis metric (e.g., change from baseline, final value, time to event), method of aggregation (e.g., median, proportion), and time point for each outcome	Page 3-4 (Observational indicators and evaluation criteria)
Harms	15	How harms were defined and assessed (e.g., systematically, non-systematically)	Page 3 (ADR definition and assessment)
Sample size	16a	How sample size was determined, including all assumptions supporting the sample size calculation	Page 2 (Sample size calculation)
	16b	Explanation of any interim analyses and stopping guidelines	NA (No interim analyses)
Randomisation:			
Sequence generation	17a	Who generated the random allocation sequence and the method used	Page 3 (investigator with no role, computer-generated)
	17b	Type of randomisation and details of any restriction (e.g., stratification, blocking and block size)	Page 3 (simple 1:1 randomisation, no stratification)
Allocation concealment mechanism	18	Mechanism used to implement the random allocation sequence (e.g., central computer/telephone; sequentially numbered, opaque, sealed containers), describing any steps to conceal the sequence until interventions were assigned	Page 3 (sequentially numbered, opaque, sealed envelopes)
Implementation	19	Whether the personnel who enrolled and those who assigned participants to the interventions had access to the random allocation sequence	No

Blinding	20a	Who was blinded after assignment to interventions (e.g., participants, care providers, outcome assessors, data analysts)	Page 3 (outcome assessors blinded; patients and clinicians not blinded)
	20b	If blinded, how blinding was achieved and description of the similarity of interventions	Page 3(Outcome assessors were blinded to group allocation by using coded data sheets. The two groups received the same routine care except for the additional pharmacist-led sessions.)
Statistical methods	21a	Statistical methods used to compare groups for primary and secondary outcomes, including harms	Page 4(t-test, χ^2, repeated-measures ANOVA)
	21b	Definition of who is included in each analysis (e.g., all randomised participants), and in which group	Page 4(Statistical analysis.)
	21c	How missing data were handled in the analysis	Page 4(Statistical analysis.)
	21d	Methods for any additional analyses (e.g., subgroup and sensitivity analyses), distinguishing prespecified from post-hoc	No
Results			
Participant flow, including flow diagram	22a	For each group, the numbers of participants who were randomly assigned, received intended intervention, and were analysed for the primary outcome	Supplyfile Fig.S1
	22b	For each group, losses and exclusions after randomisation, together with reasons	Supplyfile Fig.S1
Recruitment	23a	Dates defining the periods of recruitment and follow-up for outcomes of benefits and harms	Page 2 (July 2023 to December 2023; 6-month follow-up)
	23b	If relevant, why the trial ended or was stopped	The trial completed as planned.
Intervention and comparator delivery	24a	Intervention and comparator as they were actually administered (e.g., where appropriate, who delivered the intervention/comparator, how participants adhered, whether they were delivered as intended [fidelity])	Page 2,3
	24b	Concomitant care received during the trial for each group	Concomitant medications for COPD (e.g., short-acting bronchodilators) were recorded but not standardized.No significant

			differences between groups were observed.
Baseline data	25	A table showing baseline demographic and clinical characteristics for each group	Page 4 and Supplyfile Table S1
Numbers analysed, outcomes and estimation	26	For each primary and secondary outcome, by group: ● the number of participants included in the analysis ● the number of participants with available data at the outcome time point ● result for each group, and the estimated effect size and its precision (such as 95% confidence interval) ● for binary outcomes, presentation of both absolute and relative effect size	Page 4-5 (Results section)
Harms	27	All harms or unintended events in each group	Page 5 (ADR comparison)
Ancillary analyses	28	Any other analyses performed, including subgroup and sensitivity analyses, distinguishing pre-specified from post-hoc	No
Discussion			
Interpretation	29	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	Page 5-7 (Discussion)
Limitations	30	Trial limitations, addressing sources of potential bias, imprecision, generalisability, and, if relevant, multiplicity of analyses	Page 7 (Limitation section)

*We strongly recommend reading this statement in conjunction with the CONSORT 2025 Explanation and Elaboration and/or the CONSORT 2025 Expanded Checklist for important clarifications on all the items. We also recommend reading relevant CONSORT extensions. See www.consort-spirit.org.

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